

What is claimed:

1. (Amended) An optical disc recording/reproduction apparatus for recording and/or reproducing data by applying a beam from an optical head unit through a substrate of an optical disc onto/from a recording layer of the optical disc, wherein said substrate of said optical disc has a thickness of 0.3 mm or below, and said optical head unit comprises:

an objective lens for converging an incident beam and emitting the beam toward said optical disc;

a forward lens for converging the beam introduced through said objective lens and applying the beam to said optical disc;

a lens holder in which said objective lens and said forward lens are fixed; and

an actuator for driving said objective lens and said forward lens as a unitary block and controlling at least focusing,

said objective lens and said forward lens having (1) a total numerical aperture of 0.8 or above, (2) a center position shift tolerance of $\pm 80 \mu\text{m}$, (3) an assembly accuracy of a distance between the objective lens and the forward lens of $\pm 25 \mu\text{m}$ [or less], and (4) inclination angles less than 0.4° .

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2. An optical disc recording/reproduction apparatus as claimed in claim 1, wherein said forward lens and said substrate define a working distance of 50 μm to 500 μm .

3. An optical disc recording/reproduction apparatus as claimed in claim 1, wherein said forward lens and said objective lens have aspherical surfaces into/from which said beam is introduced. 25

4. An optical disc recording/reproduction apparatus as claimed in claim 1, wherein said forward lens and said objective lens are fixed at a predetermined distance in said lens holder. 30

5. An optical disc recording/reproduction apparatus as claimed in claim 1, wherein said actuator carries out tracking control of said forward lens and said objective lens.

6. An optical disc recording/reproduction apparatus as claimed in claim 1, said apparatus further comprises a magnetic head for applying a magnetic field to said recording layer of said optical disc. 35

7. An optical disc recording/reproduction method for applying a beam from an optical head having an objective lens for converging and emitting the beam toward an optical disc and a forward lens for converging the beam from said 40

objective lens and emitting the beam to a recording layer through a substrate of said optical disc so as to record or reproduce data onto/from said recording layer, wherein

said objective lens and said forward lens are fixed in a holder and are driven as a unitary block for focus control and said substrate of said optical disc a thickness of 0.3 mm or below, and

said objective lens and said forward lens have (1) a total numerical aperture of 0.8 or above, (2) a center position shift tolerance of $\pm 80 \mu\text{m}$, (3) a distance between the objective lens and the forward lens of $25 \mu\text{m}$ or less, and (4) inclination angles less than 0.4° .

8. An optical head unit for applying a beam through a substrate to a recording layer of an optical disc so as to record and/or reproduce data onto/from said recording layer, said optical head unit comprising:

a first lens for converging an incoming beam and emitting the beam toward said optical disc;

a second lens for converging the beam emitted from said first lens and emitting the beam to said optical disc;

a lens holder in which said first lens and said second lens are fixed at a predetermined distance; and

an actuator for driving said lens holder so as to carry out at least focus control,

wherein said first lens and said second lens have (1) a total numerical aperture of 0.8 or above, (2) a center position shift tolerance of $\pm 80 \mu\text{m}$, (3) a distance between the first lens and the second lens of $25 \mu\text{m}$ or less, and (4) inclination angles less than 0.4° .

9. An optical head unit as claimed in claim 8, wherein said second lens and said substrate define a working distance of $50 \mu\text{m}$ to $500 \mu\text{m}$.

10. An optical head unit as claimed in claim 8, wherein said first lens and said second lens have aspherical surfaces from/to which said beam is introduced.

11. An optical head unit as claimed in claim 8, wherein said actuator drives said lens holder for carrying out tracking control.

7. (Amended) An optical disc recording/reproduction method for applying a beam from an optical head having an objective lens for converging and emitting the beam toward an optical disc and a forward lens for converging the beam from said objective lens and emitting the beam to a recording layer through a substrate of said optical disc so as to record or reproduce data onto/from said recording layer, wherein

said objective lens and said forward lens are fixed in a holder and are driven as a unitary block for focus control and said substrate of said optical disc a thickness of 0.3 mm or below, and

said objective lens and said forward lens have (1) a total numerical aperture of 0.8 or above, (2) a center position shift tolerance of $\pm 80 \mu\text{m}$, (3) an assembly accuracy of a distance between the objective lens and the forward lens of $\pm 25 \mu\text{m}$ [or less], and (4) inclination angles less than 0.4° .

8. (Amended) An optical head unit for applying a beam through a substrate to a recording layer of an optical disc so as to record and/or reproduce data onto/from said recording layer, said optical head unit comprising:

a first lens for converging an incoming beam and emitting the beam toward said optical disc;

a second lens for converging the beam emitted from said first lens and emitting the beam to said optical disc;

a lens holder in which said first lens and said second lens are fixed at a

predetermined distance; and

an actuator for driving said lens holder so as to carry out at least focus control,

wherein said first lens and said second lens have (1) a total numerical aperture of 0.8 or above, (2) a center position shift tolerance of $\pm 80 \mu\text{m}$, (3) an assembly accuracy of a distance between the first lens and the second lens of $\pm 25 \mu\text{m}$ [or less], and (4) inclination angles less than 0.4° .

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